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ABSTRACT

This report discusses measurement issues and their usefulness as indicators of student success at the Colleges of Applied Arts and Technology of Ontario. The following sections are included: (1) executive summary; (2) introduction; (3) retention rates, which discusses a number of issues associated with defining and measuring graduation rates; (4) key performance indicators (KPIs), which discusses KPIs and expands on the discussion of the graduation rate measure; (5) the five case studies, which considers graduation measurement issues as they relate to five colleges in Ontario--Canadore College, Humber College, Boreal College, Sir Stanford Fleming, and Fanshawe College; and (6) conclusions, which sets out the broad conclusions with respect to measurement issues and policy concerns. Key conclusions and recommendations include: the graduation rate is an invalid indicator of labor market success of college graduates; do not use graduation rates for provincial funding; start with pilot studies for calculating the graduation rate based on college student identifier number; launch a survey of early college leavers--identify successful from unsuccessful leavers; develop a province-wide student number system; and initiate a systematic long-term survey of students and young workers. The appendix section provides some of the basic background data and information discussed in this study. (VWC)

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MEASURING GRADUATION AND ATTRITION AT ONTARIO COLLEGES

A DISCUSSION OF MEASUREMENT ISSUES AND THEIR USEFULNESS AS INDICATORS OF STUDENT SUCCESS

Key Conclusions And Recommendations:

- The Graduation Rate Is An Invalid Indicator Of Labour Market Success Of College Graduates
- Do Not Use Graduation Rates For Provincial Funding
- Start With Pilot Studies For Calculating the Graduation Rate Based On College Student Identifier Number
- Launch A Survey Of Early College Leavers -- Identify Successful From Unsuccessful Leavers
- Develop A Province Wide Student Number System, Initiate A Systematic Long-Term Survey Of Students And Young Workers

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March 20, 2000

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1.0 EXECUTIVE SUMMARY

Introduction and Terms of Reference

Arthur Donner and Fred Lazar were retained by the Association of Colleges of Applied Arts & Technology of Ontario (ACAATO) to identify, if possible, a valid and policy useful formula that links together for the Colleges the graduation rates and labour market success of their graduates.

The assignment has a number of complex sub-components. We were asked to assess the usefulness and the validity of the "cohort-based" measure of graduation used by Ontario Colleges, and whether the current measures could be improved. We were also asked to consider whether the graduation rates of Colleges actually reflect the labour market success of graduates. Finally, we were asked to address a very important public policy question: whether it was appropriate to use the college graduation rate for Government fiscal allocation purposes.

Fortunately, our analysis was able to tap into the considerable expertise that exists in the Colleges and the Ministry with respect to the KPIs, graduation rate calculations, and funding issues. We held two roundtable consultation sessions with college officials, one with the College Presidents, the other with officials directly involved in providing KPI information for measurement purposes.

Ministry officials were very helpful to us all along the way both in terms of sharing data that they had compiled and in terms of setting out the Ministry position on KPIs and the graduation rate. Ministry officials also attended the two roundtable sessions. Finally, we undertook some special pilot studies and consultations with five Colleges with respect to their reporting on KPIs and the measurement of graduation rates at the program level. The pilot studies suggest that adapting a student tracking measure of graduation at the college level should not be too onerous.

KPIs and the Graduation Rate

The need for this research stems from an important new policy direction introduced by the Ministry of Training, Colleges and Universities (MCTU) that requires the Colleges to publish key performance indicators (KPIs) for the general public as well as for the Ministry. Other provinces in Canada and several state governments in the US have also introduced their own versions of KPIs in their jurisdictions.

The four key performance indicators that were initially developed were the graduate employment rate for each College, the graduate satisfaction rate, the student satisfaction rate and the employer satisfaction rate. Three of the KPIs (the graduate employment rate; graduate satisfaction rate; and employer satisfaction rate) are presently tied in a small way to Provincial funding of colleges. A fifth KPI – the graduation rate and its alter ego, the retention rate – is also calculated by the Colleges. But a number of problems have arisen both with the calculation and the methods as well as with the interpretation and use of the data. Consequently, the college graduation rate is currently not tied to Ministry funding, though our consultations with college officials, stakeholders and other experts suggest that there is some risk that in the future the Ministry would also use the graduation rate for fiscal allocation purposes.

Clearly it is important that the KPIs, and in particular the graduation rate, accurately represent what is really going on and accurately reflect the interests of the key stakeholders – students, employers, the Government (MCTU specifically) and the 25 Colleges. It is also important that the graduation figures not mislead the college officials, the public, students, or the Ministry officials.

Unfortunately, the current "cohort class" method for measuring college graduation rates is flawed, and the data are very misleading, particularly at the program level. Under the present system there is no tracking of individual college students, as is the case in the university measurements. As well, the Colleges use a shorter time frame than do the Universities in calculating graduation rates and the cohort methodology is backward looking rather than the more traditional forward looking.

The tracking of individual students is clearly the direction to go in terms of monitoring college graduation rates. This is confirmed not only by the Ontario Universities' experience, but also by the experiences of other jurisdictions. However, while the student tracking approach would provide superior information compared to the present cohort method, nonetheless in the college case, even this method could result in findings that are problematic and misleading, particularly with respect to the labour market achievements of graduates and early leavers from Colleges.

College Graduation is an Invalid Indicator of Labour Market Success

College graduation rates at the program level only partially correlate with short-term (i.e. immediate) labour market success, since we have no data relating to the employment experiences of the early leavers. But there is a fairly extensive literature explaining the apparent high level of college attrition (approximately 45% in Ontario), though the literature is limited in terms of dealing with the labour market success of college graduates compared to non-graduates from Colleges.

The amount of information on successful versus unsuccessful leavers is very limited. However, there are many anecdotal examples of early leavers who are successful in the job market, particularly when the job market is hot. In other words, one cannot assume that attrition correlates with an unsuccessful job situation. The reverse might be the case, that the college experience, without formal completion of programs, was still a valuable input for the job market.

Labour market success at the college level involves much more than formal graduation. In some parts of the job market, formal credentials, graduation and a certificate are necessary to qualify for a job. For other jobs, formal credentials are not required. Only some degree of training and work experience are necessary.

Some Background Conclusions Derived from our Consultations and Research

KPIs, Graduation Rates and Labour Market Success

Our research suggests that, with the exception of the graduation rate, that the four other KPIs provide some value added to the key stakeholders – the Colleges, MCTU, students, employers and the wider community. However, even these KPIs have only an immediate, not longer run, linkage to the labour market success of college graduates.

For example, the graduation employment rate and the employer satisfaction rate are not monitored over longer time periods. Nor for that matter is the quality of the jobs (as reflected in incomes earned) a consideration in these measures; nor is upward mobility reflected in the Ministry survey data. Finally, the labour market experiences of early leavers (non-graduates) are also not taken into consideration with these measures.

The KPI statistics gathered by the Colleges with the assistance of the Ministry also indicate that there is a link between student OSAP defaults and the graduation rate from programs. Consequently, there is a need to improve the graduation rate data, even if they have only limited use in evaluating labour market success.

As already noted, the cohort approach for measuring graduation rates at the college program level is flawed and misleading. Nonetheless the cohort methodology currently used by the Colleges may be useful with respect to calculating aggregate graduation rates. But the figures are not useful on a program-by-program basis. Indeed, the figures at a program level jump all over the place (in some cases with graduation rates above 100%), suggesting that there are some major problems with the current measurement basis.

Interpreting Comparative Graduation Rate Data

The Colleges in Ontario are very diversified in terms of their program offerings. Since separate programs have very different graduation rates, the comparisons of aggregate graduation rates among Colleges are problematic.

Nonetheless, with all of its flaws, Ontario's aggregate college graduation rate (55%) compares favourably with the graduation rates in other jurisdictions. For example, the national US college graduation rate was 38% for two-year programs. The rate in Newfoundland was 50% and the graduation rates in Kentucky and South Carolina were 11% and 14% respectively.

Similarly, comparing college graduation rates on a system wide basis with university graduation rates is also analytically misleading, though Universities reported a higher average graduation rate – 71% compared to 55% for the Colleges. .

The common problem in comparing graduation rates across different jurisdictions and between Colleges and Universities in Ontario is that different approaches and definitions are used.

Why are College Graduation Rates Typically Lower than Universities?

The literature, our consultations and the pilot studies all point to the same general explanations for higher average attrition at the Colleges compared with the Universities. Demographic and

socio-economic factors, combined with an open access policy at Ontario's Colleges, are the key factors that explain the higher measured attrition rates and relatively lower graduation rates at the Colleges. In a nutshell, Colleges are more unique than Universities.

- College students tend to be older than their university counterparts, and have different goals for entering Colleges. Students entering the Colleges from high schools or from the work force are more immediately required to make career choices than their counterparts entering Universities.

- Some college students receive work experience as part of their college education, and are tempted by job offers while enrolled in their programs.

- To a greater degree than is possible at the college level, students entering University can select a number of courses in their first year before they decide to specialize.

- There is considerable diversity among the Colleges in terms of the student population, the program/course offerings, and the strength of the local labour market.

- Colleges also stress easy entry access to programs relative to their university counterparts. One well-known researcher indicated that "Institutions that admit large numbers of less-well prepared students will tend to have low retention rates, regardless of how effective their retention programs are". Consequently, it is unfair to compare the retention rates of different types of institutions.

- Finally, success at the college level involves more than graduating students. Indeed, in some programs, graduation and a certificate are necessary to qualify for a job. For other jobs, formal credentials are not required. Only some degree of training and work experience is necessary.

Improving the Measurement of Graduation Rates at the Colleges

Under the cohort measurement system, retention is described as "students who complete diploma/certificate programs within a minimum time frame expressed as a percentage of entering students." Unfortunately, this graduation rate measure often provides misleading (and even silly) findings because of so much program switching, dropping in and out of the system and movement between Colleges, the labour market and Universities.

The university tracking system assigns graduating students to the programs in which they first enrolled and thus is preferable to the cohort tracking system, which assigns graduating students to the programs from which they graduate. However, what do the resulting university program graduation rates tell us about the "success" of each program? Even though the university tracking system captures transfers between programs within the same institution, the reported graduation rates do not necessarily correlate with the ability of a program to enhance its students' labour market opportunities.

Another problem arises when a program requires as a pre-requisite for entry a year or more of general education or another program. In such cases, it is important to properly define the entry year. If the entry year is defined as the year in which a student starts the program rather than the year a student enters into a College or University, then graduation rates will tend to be higher, ceteris paribus, than for programs where the entry year is the one in which a student first enrolled in the post-secondary institution. Aggregate institution graduate rates also will be higher where the entry point is defined as the year in which a student enters a program.

The introduction of a university style measure of graduation rates at the program level (i.e. following individual students rather than cohorts) would be an improvement over the current system. But recognize that using a college institution identifier will still face the problem of capturing and measuring students moving between different Colleges and in and out of the college system (either to the job market or to other post-secondary educational opportunities).

In closing, while a university style student tracking system is superior to the current cohort approach used by the Colleges, its findings might also prove problematic.

Our Key Conclusions and Recommendations

General Conclusions And Recommendations

- The graduation rate is an invalid indicator of the labour market success of college graduates.
- Do not use graduation rates for provincial funding at this time.
- Start with pilot studies for calculating the graduation rate based on college student identifier numbers.
- Launch a survey of early college leavers to identify successful from unsuccessful leavers.

The research and evidence we have marshalled suggest that the college graduation rate is an invalid measure of labour market success. Indeed, the measured college graduation rates have little bearing on the labour market success of graduates and/or the early leavers. Even if the graduation rate is better constructed, we would still worry that the information would be of limited use to outsiders and could be easily misinterpreted.

Consequently, the graduation rate should not be used for Ministry funding. In effect, we have to look at measures other than the college graduation rate to better reflect labour market success.

It is still worthwhile, however, to improve the measurement of graduation rates at the College level for internal college planning purposes. Consequently, ACAATO should propose that MTCU move towards introducing a student tracking measurement system for graduation based on college student identification numbers.

To ensure that the graduation rate data are reliable, ACAATO should suggest that MTCU sponsor several pilot studies, experimenting with starting and ending dates (i.e. the starting point-semester one or two, and the termination point, up to five years).

ACAATO should also petition MTCU to undertake a survey of early leavers from college programs, attempting to identify successful from unsuccessful college leavers in terms of the job market prospects. We believe that this kind of a survey would provide value both to the Colleges and to the Ministry.

A Better Method for Linking Retention to Labour Market Success

Our research suggests that the Ontario labour market is very dynamic, and that new entrants into the labour market quite properly experiment (job hop) before settling down into a career/job path. There is a counterpart to the labour market/job hopping when one considers student mobility between different college programs and within and between Colleges and Universities. All of this complicates the measurements and interpretation of graduation statistics.

Accordingly, the optimum approach would be to establish a provincial wide student identification number, and use it to follow the education experiences and job paths of Ontarians. The provincial wide number approach also allows for a much longer time period in terms of tracking the labour market experience of those who have graduated and of those who are truly early leavers from the Colleges. This long-run tracking approach may solve the problem of the inadequacy of the graduation rates. It is only when we have a better grasp on the job experiences of early leavers and graduates that we can then assess the labour market validity of college programs.

2.0 INTRODUCTION

2.1 Objectives

Accountability in post secondary education and training institutions and programs has become more prominent for funding decisions by the Ontario Government, as well as in many other jurisdictions in recent years. In the US, the combination of increased costs along with decreased state resources have resulted in public demands that college and university administrators take steps to ensure greater quality, productivity and effectiveness of their institutions. Colleges and Universities are being asked to be more responsive to state concerns and to be publicly accountable to stakeholders – students, parents, employers and the general public. Several states have adopted performance measures to respond to these accountability demands.

Historically, Ontario's Colleges have had a tradition of being accountable through methods such as community-based governance, program advisory committees and provincial program standards. In their search for quality, Colleges build into their internal processes opportunities to review and reflect on the nature, content and delivery of their programs. Perceptions are sought from students, graduates, employers of graduates, advisory committees, faculty and staff of the College and members of the college's Board of Governors. These inputs are synthesized with statistical reporting processes to create a view of the college's effectiveness in carrying out its mandate.

Lacking, however, has been a system-wide accountability framework that actually measured colleges' performances against goals identified by the ministry responsible for postsecondary education and the Colleges. Accountability requires a set of objectives for these institutions and a means for measuring the success for each institution in achieving the defined public policy goals. In Ontario, the provincial government has indicated that it intends to depend more heavily on Key Performance Indicators (KPIs) in its future policy and funding decisions. Five KPIs have been identified thus far: post-college outcomes, graduate satisfaction, employer satisfaction, student satisfaction and graduation rates.

It is important that the KPIs provide the information needed to assess whether the institutions are achieving the goals set by the government. In the case of the 25 Colleges, which comprise ACAATO, the KPIs should reflect what is important for students, employers and the taxpayer and accurately represent the degree of success that each College has in serving the needs of each stakeholder group.

Accountability should be centered in the mission of the college system and should respect the diversity of each College in Ontario. Internal accountability processes can be strengthened by a well-structured and complementary system of external accountability measurements – the right set of KPIs. But these KPIs need to be clear and explicit and relate performance to purpose and expectations. Measuring performance is an ongoing, evolutionary process that should contribute to the improvement of the quality of what Colleges do.

In 1998, the Colleges worked collaboratively with the MTCU to implement the first public sector key performance indicator project in Ontario. The following are the four key performance indicators that were developed through the joint effort of the Colleges and the MTCU:

- Graduate employment rate of each College;
- Graduate satisfaction rate of each College;
- Student satisfaction rate with the Colleges; and
- Employer satisfaction rate (i.e. satisfaction with the generic/vocational skills of their employees who graduated from the Colleges).

Data collection on graduate outcomes, graduate satisfaction and employer satisfaction began in the Fall of 1998. The results released in 1999 demonstrated that the Colleges in Ontario provide the quality education and training that Ontario needs in the knowledge economy.

These three KPIs (graduate employment rates, graduate satisfaction and employer satisfaction) will be factored into the mechanism for distributing government transfer payments to the Colleges starting in fiscal year 2000-01. Commencing with this fiscal year, 2% of the allocation of funding for operating grants for the Colleges will be based on these KPIs. The comparisons will be across the 25 Colleges in Ontario. No comparison will be made between the Colleges and the Universities, at least at the outset. Student satisfaction and student graduation data, also being gathered beginning with the 1998-99 academic year, will not be tied to funding distribution at this time.

It is important to keep in mind that when the link between KPIs and funding begins, 98% of the funding will continue to be based on total college enrolment. If a College attracts students, it also will attract money from the province. Eventually these three indicators will account for up to 6% of total funding for the Colleges.

Funding models are now being evaluated to ensure that the KPIs serve the ultimate objectives of program and service improvements at the Colleges. For example, the government would like to see a 100% employment rate for college graduates and will reward the Colleges that succeed in placing their students in jobs. But should Colleges located in regions with unemployment rates above the provincial average be penalized if they attain marginally lower graduate employment rates?

Several questions have been raised about the graduation rate KPI. For example, it is difficult to define and measure and the interpretation of this variable in respect to the roles of the Colleges and the public policy goals set out for these institutions is ambiguous.

Since there are considerable and legitimate concerns over the measurement and interpretation of the graduation rate KPI measure, the provincial government is not yet using it for fiscal allocation purposes. Moreover, the Colleges are not required to publish anything other than the aggregate college graduation rate with the other KPI information that is being made available.

Nevertheless, the fact that the 25 Colleges in Ontario are not homogeneous either in programs, geographic locations, their history and their student demographics complicates the interpretation of broad brush KPI measures. Thus, to be useful, the KPIs, especially the graduation rates should allow for differences among the Colleges and between the Colleges and other post-secondary institutions, in particular the Universities.

Hence, the purpose of this research project is to examine the feasibility of using the graduation rate for funding allocation decisions, and if so, to identify for the Colleges and the Ministry a policy useful formula that links together graduation rates and the labour market success of graduates.

As a starting point, one can ask whether it is appropriate to equate the graduation rate with labour market success? Statistics Canada data suggest that this is indeed the case. Labour market survey data reveal that there is an inverse correlation between education and unemployment rates and a positive correlation between educational attainment and incomes.

But does this mean that it is right to assume that non-graduation equates to labour market failure?

The traditional concept of the graduation rate, regardless of how it is measured, does not necessarily provide a reliable indicator of the "success" of the Colleges in achieving the government set goals. The number of graduates and the program and aggregate graduation rates do not reflect those students who have had a positive experience in College and who may have secured employment related to their area of education and elected not to finish their programs; temporarily gone back to work only to continue with their studies at a later time on either a full-time or part-time basis; or, decided to continue their programs on a part-time basis. Thus, failure by a student to complete a college program within a fixed period of time does not necessarily mean that such students have not benefited from their education or that they have not improved their labour market opportunities and status.

Experimentation with jobs and college programs and continual movement between the labour market and the education market characterise a dynamic economy where technological change requires a flexible, mobile and adaptable work force. The possibility for a life-long education experience plays a key role in ensuring that the work force has these important characteristics. This, in turn, has important implications for defining and interpreting graduation rates and for an education system where students complete the requirements for their degrees/certificates/ diplomas and at the same time complete their formal education.

2.2 Role of the Colleges

As a starting point in any discussion of the purpose and value of KPIs in general, and the graduation rate in particular, it is useful to identify the role of the Colleges in the post-secondary education and training system in Ontario. While identifying the role of the Colleges will depend upon which group of stakeholders – students, employers, administrators, tax payers, government

– one asks, there is likely to be agreement that a key role, if not the primary role, is to develop and augment the stock of human capital in the province.

The specific role identified for the Colleges of Applied Arts and Technology of Ontario is to develop graduates who have achieved learning outcomes that are consistent with broad-based employment and societal needs and who are able to adapt to changing employment/workplace demands, within an environment that facilitates student learning and promotes personal and professional growth.

Since a fundamental role of Colleges is to train people for a continually changing labour market, then graduation from a program may not necessarily correlate with the degree of success that Colleges have in fulfilling this role. Developing human capital may not require the traditional linear model of education, where a student enters, completes the program and then permanently leaves.

Colleges will be successful in fulfilling their role if they allow their students to integrate life-long learning and training with job experience. Flexibility requires students/workers to be able to have or attain the skills and training needed to fill a large number of jobs during their careers. It will become increasingly rarer for an individual to enter the labour market after graduation from some education program and to work for the same employer and in a similar job role throughout her/his work-life.

Colleges will be facilitating labour market flexibility and will be supporting a dynamic economy by providing an environment where individuals can drop in whenever they need skills upgrading or retraining, and drop out when they have achieved their personal labour market goals, only to re-enter again at a later date when a future need arises. **In this world, and it is the one that is evolving, and for countries to be successful they must accommodate their social and education infrastructure and policies to it, the linear model leading to graduation within a set time period may become increasingly outdated.**

As a result, the traditional concept and measurement of the graduation rate may be compatible with the education/training model that was or currently is, but not with the model that should and will be. Current trends in the nature of work/jobs and the pace of workplace change suggest that students will increasingly demand only the appropriate "bite-sized" educational modules that fit their specific needs. Increasing demand for modularized education suggests that to measure performance in completion of programs, many with rigid start and finish points, might be focusing on a diminishing model. An alternative model would measure course completions against course attempts.

2.3 Defining Success

There are a number of stakeholders in the college system. As a result, success is a multi-faceted concept. Defining success depends upon what the role is of the college system as a whole, and of each College within the system. And the definition will depend upon which of the stakeholder

groups one asks. So, it is unreasonable to expect that one indicator can provide a good measure of how successful Colleges are in achieving their goals.

Thus, that there is controversy over the definition, measurement and value of graduation rates is to be expected.

As one commentator has asked: is success to be measured by the ability of a post-secondary institution "to keep clients captured for the full period of their sentence?" Furthermore, how do you measure success for programs where graduation is a failure; for example, fine arts where if students have not been picked up for a role, then they have not succeeded?

Students get work experience as part of their college education, and so they may be tempted by job offers while enrolled in their programs. Employers have experience with students and so may be more likely to offer them jobs. In the following areas – printing, graphic design and animation – employers are not waiting for students to graduate before offering them attractive jobs.

Therefore, stopping out may not necessarily have negative repercussions for students and society as whole. Students can drop out to take advantage of job opportunities and may return at a later date to complete their programs or transfer into new programs. Furthermore, students in Colleges are more likely to experiment with courses and programs than students in Universities because, with the exception of the professional programs at the Universities, Colleges are more career-oriented.

One of the leading researchers in the field of student attrition, Vincent Tinto, suggests that the term "drop out" be eliminated from any future discussions about student withdrawals. His reasoning for not using the term is that many community college students can "stop out" from their studies (i.e. leave for a period of time and then at some point return), or they can transfer to other post-secondary institutions or training programs, or they can be required to leave because of misconduct, or the can just quit their studies altogether. The singular term "drop out", as used in our post-secondary system, can hinder a full understanding of the various types of "early leavers." (Working Group Report, p. 5)

Each College has a different mix of students, faces different labour/economic market conditions and serves different social needs. Thus, Colleges take different paths to achieve their goals – and so success for each College is difficult to define.

Nevertheless, graduation rates, if properly defined and measured, may serve a role. But alone and without clarification, these rates do not measure success for the Colleges. For example, Ontario Colleges had an average system-wide retention rate of 55% in the 1997-98 academic year. The graduation rate for the US for two-year Colleges was 38% in 1997-98. Does this mean that the Colleges in Ontario are more "successful" than the two-year Colleges in the US?

As well, in 1997-98 the average graduation rate for Universities in Ontario was 71%. Do Universities better fulfill their mandates than the Colleges in Ontario? Which group better serves

the needs of society? Is it proper to equate the low graduation rate at some Colleges with labour market failure? Alternatively, is it right to assume that non-graduation equates to labour market failure?

In other words, a major policy issue relates to defining what is a successful graduation from a College. Is it finishing/receiving a diploma or is it generating a job in a program-related field?

College	***Graduation Rate***
Algonquin	61%
Boreal	73
Cambrian	50
La Cite	46
Canadore	61
Centennial	49
Conestoga	63
Confederation	72
Durham	55
Fanshawe	57
Georgian	61
George Brown	59
Grand Lacs	67
Humber	53
Lambton	45
Loyalist	61
Mohawk	49
Niagara	53
Northern	43
St. Clair	37
St. Lawrence	54
Sault	51
Seneca	46
Sheridan	71
SS Fleming	62
Provincial Average	55

There also was considerable variation in the average graduation rates across Colleges and Universities. Among the 25 Colleges, the lowest aggregate rate was at St Clair at 37% and at Northern at 43%, while the highest rate was at Boreal at 73%. Carleton had the lowest graduation rate (46%) among the Universities, with Queen's having the highest (87%). By ranking the Colleges and Universities in descending order of graduation rates, can one conclude that the resulting rank order is appropriate in terms of their relative degrees of labour market success or training? We do not think so!

Colleges and Universities differ in many significant ways, including their pedagogical, social and economic roles. Accessible career programs or courses coupled with relatively lower tuition fees encourage students to enroll in Colleges who may be academically underprepared or ambivalent about a post-secondary education. Attrition is higher for students have not completed their OACs and the open access policy for Colleges results in many such students enrolling in Colleges in Ontario. As well, courses feared towards updating the skills of employees of local businesses may attract students who do not intend to complete the full career programs.

Further, the socio-economic demographics of students – age, parental responsibility, income, education attainment of parents and secondary level education – differ between Colleges and Universities. The average age of Ontario college students is 26, more than 60% do not come directly from high school, over 55% require financial aid and double the number of single, sole-support parents attend College than University in the province.

University	***Graduation Rate – 6 years***	***Graduation Rate – 7 years***
Brock	71%	72%
Carleton	44	46
Guelph	67	69
Lakehead	59	61
Laurentian	54	56
McMaster	74	75
Ottawa	64	66
Queen's	86	87
Toronto	61	63
Trent		
Waterloo	75	77
Western	74	74
Wilfrid Laurier	81	82
Windsor	55	56
York	58	60
Ryerson	56	57
Nipissing	54	56
OCA		

As a result, graduation rates should differ between Colleges and Universities. Therefore, comparisons of graduation rates across programs, across Colleges and between Colleges and Universities should be based on some form of indexing of the reported graduation rates to normalized or anticipated rates predicated on some correlation with one or more measures of success.

The non-indexed, graduation rates could be useful for internal planning within Colleges. They also may be useful as one of many inputs into policy-making decisions by the provincial government. However, they may be entirely misleading to the public and lead to poor decisions by students considering their post-secondary education choices.

Moreover, Colleges should not base their longer-term plans on measures of success which may be backward looking (in order to maintain their government funding), but rather on measures which more accurately reflect their longer term economic and social objectives.

2.4 Outline of the Report

The Report is organized as follows. Section 3 discusses a number of issues associated with defining and measuring graduation rates. The issue is discussed not only at an empirical level, but also in terms of assessing the policy distortions that could occur when comparing graduation rates within the college system and between Colleges and Universities.

Section 4 discuses KPIs and expands on the discussion of the graduation rate measure. Lessons from other jurisdictions and some discussion of the relevant literature relating to measurement issues and the labour market experience of College and other post secondary graduates are also presented in section 4.

Section 5 considers graduation measurement issues as they relate to five Colleges in Ontario – Canadore College, Humber College, Boreal College, Sir Sanford Fleming and Fanshawe College. The main point for the case studies is to indicate to ACAATO the level of progress being made on measuring college graduation at a student level.

The final section of the Report sets out our broad conclusions with respect to measurement issues and policy concerns. The recommendations in this section are intended to provide ACAATO and the Colleges with a useable and practical direction for improving the measurement and the use of college graduation statistics.

The appendix section, which is attached at the end of this Report, provides some of the basic background data and information discussed in our study. The data that are reviewed and discussed in the appendix includes KPI system data for the Colleges and the Universities, the measurement of graduation rates in other jurisdictions, the five case studies and the program graduation rate at three universities – Carleton, Queen's and Guelph.

3.0 RETENTION RATES

3.1 Definition

According to a MTCU/ACAATO joint statement, retention is described as "students who complete diploma/certificate programs within a minimum time frame expressed as a percentage of entering students." The above definition is the crux of the measure currently being used. The cohort method is currently used to measure this definition of graduation for the Colleges. The graduation rate also can be measured by tracking individual students and aggregating over all the students that enter into a College/University and/or program in either post-secondary institution.

Whichever methodology is used, the resulting graduation rate estimate depends upon when you take the picture; that is, the time period after commencement of the program. The longer the time frame, the higher and the more reliable will be the resulting graduation rates.

Furthermore, the graduation rates will be more accurate when they are aggregated over programs rather than measured on an individual program basis since this will capture students who transfer between programs.

3.2 Measuring Graduation Rates: Universities

Universities assign their own identification numbers to each student who enrolls and track each student, using these numbers, for up to seven years after first enrolling. The university graduation rate is measured in the following way. It is the percentage of students who enroll in a bachelors or first professional degree program in year X who subsequently receive a university degree between year X+1 and X+7. The data are compiled by the Ministry and verified by the separate Universities.

Graduation rates also have been calculated by relating the number of students who enroll in year X who subsequently receive a university degree between year X+1 and X+6. As expected, the graduation rates based on this measure using a shorter time frame are lower. They are lower by one to two percentage points according to the graduation rate data for the universities (see table above).

Each University has its own student identification number. There are no province-wide numbers. Therefore, the tracking system is unable to follow students across Universities, and so the resulting graduation rates may be underestimated for some Universities and over-estimated for others. For specialized programs at the undergraduate level, the starting point for tracking students for the purpose of measuring the graduation rates is a student's second year of study. Year one is considered a transition year in which students take general education courses before they decide on their area of specialization. Since a significant number of students drop out of University during their first year, graduation rates for specialized undergraduate programs will tend to be higher than if the starting point included all students who entered in first year.

In measuring the graduation rates by program, if a student starts off in Physical Education for example, but later transfers into General Arts and graduates from this program, the student is counted as a graduate of the Physical Education program.

3.3 Measuring Graduation Rates: Colleges

Colleges use the reverse cohort method to measure graduation rates; that is, they take the ratio of the total number that graduate in year X to the total number that enrolled in a one-year program in year X-1 plus those who enrolled in a two-year program in year X-2 and those who enrolled in a three-year program in year X-3. In other words, there is a single graduation year and multiple intake years. So for starters, the Colleges use a shorter time frame on average than do the Universities. They do so because college programs are shorter than those in Universities.

The cohort method provides a reasonable measure of the graduation rate at the college-wide level, but not at the program level. But even the aggregate college graduation rate is deficient because it does not capture students transferring between Colleges or between a College and a University or between a College and the labour market and back again to a College.

Moreover, the program mix is an important driver of graduation rates. One-year programs are likely to have higher graduation rates than three-year program, and this difference is likely to be compounded by the cohort method used by the Colleges to measure graduation rates. Consequently, if Colleges were to shorten program length, they could conceivably increase graduation rates. But would this change necessarily reflect greater success by the Colleges in achieving their goals?

While the plan of the MTCU is to make individual programs at Colleges somewhat accountable in terms of student success; nonetheless, comparisons of the graduation rates across programs are not reliable. Colleges offer a much larger number of programs than Universities. For example, Carleton (with a graduation rate of 46%) listed 14 starting programs and Queen's, with a graduation rate of 87%, listed 16 programs. By comparison, Humber College, with an aggregate graduation rate of 53% listed 83 programs and Boreal with a graduation rate of 73% listed 53 programs. Thus, there is a greater opportunity and indeed and a higher propensity for students to switch between programs in Colleges than in Universities.

Furthermore, the inclusion of the General Arts and Science (GAS) program in the graduation rate calculations for the Colleges is problematic since Colleges use this program as remedial area for students. The intent is not for students to graduate from GAS but to apply to core programs of choice when they are qualified through the GAS studies.

Conestoga has an aggregate graduation rate of 63% when the GAS students are included in the calculation. Excluding these students increases the graduation rate to 68%. Sheridan College has a graduation rate of 78% when the GAS students are excluded, compared to the reported 71% graduation rate. The graduation rate for GAS at Sheridan is only 13%. The graduation rate for GAS students at Lambton is 27%. This compares to the aggregate graduation rate of 45%.

As well, in Universities it does not matter in what program a student graduates, but rather the program where the student starts for purposes of measuring graduation rates by programs. For Colleges it matters in what program the student graduates. Hence, we can find many examples where some college programs report very low graduation rates, while others have graduation rates of 100% or higher.

3.4 Problems in Measuring Graduation Rates

Graduation rates by program are problematic. The university tracking system assigns graduating students to the programs in which they first enrolled and thus is preferable to the cohort tracking system, which assigns graduating students to the programs from which they graduate. However, what do the resulting university program graduation rates tell us about the "success" of each program? Even though the university tracking system captures transfers between programs within the same institution, the reported graduation rates do not necessarily correlate with the ability of a program to enhance its students' labour market opportunities.

Another problem arises when a program requires as a pre-requisite for entry a year or more of general education or another program. The GAS program at Colleges is a case in point. In addition, the Colleges have increased the number of programs which provide future options for students. In such cases, it is important to properly define the entry year, especially since 50% of students who leave Colleges during the first year do so in the first semester.

If the entry year is defined as the year in which a student starts the program rather than the year a student enters into a College or University, then graduation rates will tend to be higher, ceteris paribus, than for programs where the entry year is the one in which a student first enrolled in the post-secondary institution. Aggregate institution graduate rates also will be higher where the entry point is defined as the year in which a student enters a program.

Many of the anomalies that occur at the program level, especially with the cohort system, should be aggregated out at the institution level. However, both systems fail to capture transfers between institutions both within the college system and the university system and between the two systems. The university tracking system underestimates the graduation rates for each University. On the other hand, the college cohort system can underestimate aggregate graduation rates for some Colleges and overestimate for others.

Another issue that arises is the appropriate time frame to use for measuring graduation rates. The longer the time period, the higher should be the resulting graduation rates. But does a longer time frame necessarily correlate with "success" for both students and post-secondary institutions?

Students enrolling in University are less likely than students enrolling in Colleges to move between school and full-time work. Thus, university students should take less time to complete their formal programs and receive degrees than college students in their programs. As well, university students are more likely to be committed to completing their programs (i.e. to receive the degree) than are college students. University students may need a degree in order to improve their labour market possibilities. College students, on the other hand, may only need some

technical courses to enhance their labour market prospects and may need to periodically upgrade their skills. Formal accreditation is less an issue in the job market for College students.

Therefore, is a longer time frame more appropriate for Universities than for Colleges? Perhaps each student should have a different time frame based on his/her expectations at the time of entry into a post-secondary institution.

A common tracking period for all programs leads to longer possible periods for graduation for shorter programs. In addition, many entrants into post-secondary institutions have clear goals when they enter. Others are unclear and are likely to experiment with both programs and work. Students entering from high schools are generally required to make career choices when selecting their college programs, whereas in Universities they can select a number of courses in their first year before they decide to specialize. College students may be more likely to change their minds regarding their programs of study or even whether completing a college program is necessary. Consequently, the same starting point may be inappropriate for all students, and the same end point ("X" years after the starting point) may also be inappropriate.

3.5 Other Problems in Comparing Graduation Rates Between Colleges and Universities

There are significant differences between Universities and Colleges in terms of their roles, their objectives and the socio-economic demographics of their students. And so, one should expect differences in graduation rates and these differences should not necessarily reflect differences in success.

Colleges are more unique than Universities. The graduation rate measure is an output measure, and downplays the input side of the measure. Success at the College level is more than simply the graduation rate.

Open and easy access to Colleges makes a big difference on the input side. The student body at Colleges consists of older students, more students who are married and more single parents. These types of students are more likely to pursue a post-secondary education to upgrade their skills and to accept a full-time job offer as soon as they have achieved a given amount of upgrading rather than wait until they graduate from their programs.

The open access mandate for Colleges results in their having a number of students who require a considerable amount of remedial education. Special needs students may reduce measured graduation rates even though the Colleges are serving their social goals by helping these students prepare for the job market.

Unlike Universities, Colleges do not need to sell a product that is completed. In some programs, graduation and a certificate are necessary to qualify for a program-related job. In others, some skills training without formal completion is acceptable to employers.

One of the key roles of Colleges is to train students and help them upgrade their skills. Therefore, it is not surprising for college students to drop in and drop out. In periods of low unemployment and tight labour markets, college students are more likely to drop out and accept job offers related to their areas of study. As well, in some college programs success requires students to drop out and accept job offers.

There is now a closer association between Colleges and Universities than in the past. That is, more students are using Colleges as pre-university preparation and move to Universities after one or two years of study at a College. These students do not show up in the graduation statistics of the Colleges, even though they move onto Universities and possibly graduate from these institutions. At a minimum, General Arts and Science programs at Colleges, which serve primarily a preparatory role, should be excluded when measuring aggregate college graduation rates.

4.0 KPIs

4.1 Lessons from other Jurisdictions

The Ministry of Training, Colleges and Universities shared with us some data that were compiled on the measurement of KPIs in other Canadian and US jurisdictions. Summary tables relating to these findings are set out in the Appendix 2 section.

Alberta has implemented an individual tracking based graduation rate measure. The program completion rate is measured as the percentage of the entry cohort who complete the program within the normal program duration plus one year. The measured completion rate includes those who complete a program and those who transfer to and complete other programs within the College. The number of non-completers still active is also reported. Individual tracking of students is done only at the institution level using student institutional identification numbers. System-wide tracking of students cannot be done yet, but may be possible in two years time.

Alberta also has a common KPI system composed of 13 measures for all of its post-secondary educational institutions. As in Ontario, the KPIs are linked to funding allocations. Alberta does not follow system wide student tracking, but seems to use a cohort measure similar to Ontario's.

British Columbia has a system that tracks students based on a province wide personal education number and calculates course completion rates since Colleges in BC serve as feeders into the Universities in the province. The course completion rate is measured as the number of stable date registrations (usually three weeks into term) in courses who have grade of pass or better. BC has a high course completion rate of 80%. Note that BC excludes adult basic education, adult special education and English as a second language from the calculations.

BC also has a system of 26 KPIs that are intended to measure a wide range of outcomes associated with the achievement of system goals and objectives. The KPIs have been selected on the basis of reliability and usefulness. The following principles guided the selection of the KPIs in BC:

- Consistent data definitions and collection across college system;
- Emphasis on measuring results (outcomes and outputs);
- Valid measures of what they are intended to measure;
- Reliable over time; and
- Clear, understandable and transparent.

The general categories for the KPIs are:

- Relevance and Quality – ensure learners are able to acquire the skills and knowledge needed; ensure learners acquire the necessary competencies to function successfully in life and work; ensure learners are able to acquire job readiness and job specific skills;

- Access – ensure opportunities exist for participation in post-secondary education and training and that opportunities in all regions reflect regional education and training needs; eliminate attitudinal and physical barriers affecting participation of non-traditional learners;

promote equity of access across the system; improve opportunities for successful completion of post-secondary education; and

- Affordability – ensure post-secondary education is affordable to students; ensure post-secondary education is affordable to taxpayers.

Newfoundland measures the graduation rate for the sole College in the province by taking the number of graduates in a given year as a percentage of the total number of entrants within normal program duration. The graduation rate calculations use student information numbers. Students who leave before the academic prejudice date are excluded from the calculations. The graduation rate is 50% in the province.

Two US states, Kentucky and South Carolina, use social security numbers to track students and to calculate graduation rates.

Both South Carolina and Kentucky calculate the graduation rates by taking the first-time, full-time degree-seeking cohort of students who graduate within 150% of program duration. South Carolina excludes from the calculation of the graduation rates students taking two or more remedial courses since completion of programs by these students may take more than 150% of program duration. Kentucky also calculates the persistence rate: the percentage of full-time, degree-seeking freshmen who either graduated, transferred to another public institution or were still enrolled at the original institution after 150% of program duration. The graduation rate in Kentucky is11%. The persistence rate, which is more comprehensive, is 46%. The graduation rate in South Carolina is 14%.

The US National Center for Education Statistics (NCES) published a survey of all funded two-year college programs. NCES is the benchmark source for graduation rate calculations in the US and its benchmark is to calculate the graduation rate for a cohort within 150% of normal program duration. Thus, for a two-year college institution, graduation would be calculated based on three years after entry (i.e. the number of students who enter in year X and the number who graduate in year X+3).

In closing, comparisons of graduation rates across jurisdictions are problematic because different approaches and definitions are used. However, Ontario's aggregate college graduation rate (55%) compares favourably with the graduation rates in other jurisdictions. For example, the national US two-year college graduation rate was 38%. The rate in Newfoundland was 50% and the graduation rates in Kentucky and South Carolina were 11% and 14% respectively.

4.2 Ontario

The proposed accountability framework for Colleges in Ontario is intended to consist of a two-tier system of performance indicators: those which derive from the shared goal and common outcomes of the college system and those which reflect the mission, values, and strategic direction of the individual Colleges.

The first level is comprised of five performance indicators that will be measured at each College using standardized definitions and measurement tools. They include:

- Student Satisfaction
- Post-College Outcomes/Graduate Success
- Graduate Satisfaction
- Employer Satisfaction
- Quality Assurance.

The suggested performance indicators for the second, equally important, level are intended to provide Colleges with sufficient flexibility to relate the Accountability Framework to their individual mission/strategic direction:

- Access
- Fiscal Responsibility

The objective for the Student Satisfaction indicator is to measure performance against the goal of quality education and the student success-related goal of meeting the needs of students. The objective is to capture a variety of information from the students' perspectives, including their views regarding the quality of their learning experience; its relevance to future employment, further education and life beyond the workplace.

The Post-College Outcomes/Graduate Success indicator is intended to measure performance against the student success-related goals of: finding employment and continuing with educational pursuits. The objective is to capture information in order to determine whether alumni are able to find appropriate employment within a reasonable time frame after leaving College and/or alumni are able to gain entrance to further post-secondary studies of their choice.

The Graduate Satisfaction indicator is intended to measure performance against the student success-related goal of meeting the needs and objectives of students. The objective is to determine the opinion of college graduates regarding their college experience, including their views as to whether their College helped prepare them for a specific occupation, a specific field of work, work generally, further educational pursuits, better citizenry, or meeting other personal objectives.

The Employer Satisfaction indicator is intended to measure performance against the goal of quality education and the student success-related goal of student employability. It is important that employers are satisfied with graduate preparedness, program relevance, and the Colleges' ability to meet emerging employer needs. Measuring the rate of employer satisfaction will provide an indication of how well employer needs are being met by the college system.

The Quality Assurance indicator is intended to demonstrate that the College has and uses internal accountability processes to ensure the quality of college programs. This graduation rate serves as the proxy for this indicator.

The purpose of institutional performance indicators would be to acknowledge the diversity and the particular strengths of each College in order to support the individual Colleges in moving towards their stated strategic directions. The two general institutional performance indicators would be Access and Fiscal responsibility.

Access issues would include the ability of students to pursue their chosen program of study within a reasonable distance from their home, without undue regard for individual disabilities or other personal factors, within a time frame which is reasonable responsive to individual backgrounds, circumstances and needs.

Fiscal responsibility refers to a College's use and management of its financial resources such as its administrative efficiency and its ability to obtain, organize and administer resources so that student learning outcomes are achieved at reasonable costs.

4.3 Literature Review

A research report by Daniel Parent, "Labour Market Outcomes and Schooling in Canada: Has the Value of a High School Degree Changed over Time", analysed the school-to-work transition process in Canada, focusing on the value of a high school diploma. Statistics Canada's "School Leavers Survey and its Follow-Up" was used by Parent to derive details on labour market performance (earnings, jobs, and training histories etc.). The purpose of the study was to determine whether the value of a high school diploma (excluding the option value of pursuing post-secondary education) has markedly changed over the past 15 to 20 years. His conclusions were as follows:

- the premium to holding just a high school diploma in Canada is substantially lower than in the United States;
- labour earnings of high school graduates have stagnated and even decreased relative to those of dropouts, without major changes in the relative employment rates;
- the earnings premium of a university degree has been increasing since the mid 1980s;
- high school graduates' labour market outcomes in Canada are essentially no better than those of high school drop outs, except perhaps in terms of employment rates; and
- high school attrition was very sensitive to local labour markets.

Robert Allen found, in his study "Education and Technological Revolutions: The Role of the Social Sciences and the Humanities in the Knowledge Based Economy" (November 1999), that there is a link between the level of education and employment success as reflected in unemployment rates.

"Thus the highest unemployment rates are those of high school dropouts. They are followed by high school graduates and people with a technical or trade certificate and then by those with a college diploma.....The mediocre performance of those with a college diploma and the poor performance of those with a trade certificate is inconsistent with the basic view that specific skills guarantee a job in the new knowledge-based economy."

Allen did note that those with some university education experienced considerably higher unemployment rates than those with a university degree. The unemployment rate difference in 1996 was 2.1% for women and 3% for men.

He also reported that the percentage of Canadian workers in 1996 with managerial or professional occupations also depended upon academic credentials. For example, 71% of bachelor degrees graduates, 59% of those with some university experience, 48% of college graduates, 25% of those with trade certificates and 25% of those with only a high school graduation diploma were employed in a managerial or professional occupation.

The data Allen presented in Tables 5 and 6 of his study indicate positive correlations between income levels and the level of education for both men and women. That is, incomes tend to rise from high school non-completes, to high school graduates, to trade certificates and college diplomas.

Finally, in terms of total employment growth between 1991 and 1996 by level of education, Allen reported that total employment contracted for high school graduates and non-completes and trade certificates, while employment for those with a college diploma grew very strongly.

John Mohammadi's study, "Exploring Retention and Attrition in a Two-Year Public Community College" (VCAA Journal, Spring 1996, 39-50), attempted to explain the retention and attrition in two-year public community Colleges in the US in order to assess the usefulness of indicators of student retention and attrition for determining the effectiveness among community Colleges.

Mohammadi noted that there are conflicting views of retention and attrition at US Colleges and that most studies do not take into account the external environment affecting student participation in College.

According to Mohammadi, "There are two main reasons for this argument: (1) demographic and socio-economic factors relating to community college students are somewhat different from those relating to students attending four-year colleges. That is, on average, community college students are older, attend part-time more often, do not reside on campus, have lower degrees of goals, have lower high school grades, have more modest financial resources, are employed for more hours, have more family responsibilities, have relatively little interaction with other students outside of class, and are not strongly involved in campus activities and (2) external forces, particularly those related to community forces in the immediate geographical environment of the college's service area, are also important in understanding and interpreting the retention and attrition patterns at two-year public community colleges. For example, the need for training and retraining of the work force for business, industry, and governmental agencies within any community college service area changes the social composition of the student population, thus requiring different definitions and methodologies to study student departure."

His principal conclusions were:

- the students' goals for attending College are a very strong predictor of retention – 40% who left College after one year had no intention of completing a de gree or certificate program;
- demographic and socio-economic factors, combined with an open access policy by the community Colleges, influence the attrition/retention rates – "Institutions that admit large numbers of less-well prepared students will tend to have low retention rates, regardless of how effective their retention programs are" – consequently, it is unfair to compare the retention rates of different types of institutions; and
- college planners and government need to recognize that social forces in the immediate community directly influence retention and attrition.

Mohammadi's conclusions seem to speak strongly to the Ontario College retention issue, and were certainly supported by the feedback we received at our two Roundtable meetings with College Presidents and officials and in our other stakeholder interviews.

5.0 THE FIVE COLLEGE CASE STUDIES

5.1 Overview

We undertook to examine the experience and the graduation rate statistics for five Colleges – Boreal, Canadore, Fanshawe, Humber and Sir Sanford Fleming. Officials at MTCU believed that some student tracking was going on with respect to program graduation rates. So one of the reasons the case studies were undertaken was to see how much individual student tracking was actually going on at the college level.

Some of the key questions we posed to the college officials included the following:

- What is your college's capacity with respect to developing alternative methods of measuring attrition and graduation?
- If your College had access to an individual student tracking system for calculating graduation rates, would it be helpful for strategic planning and programming?
- How close is your College to actually tracking student graduation?
- How much work would be involved in introducing a student tracking system?

We requested examples of the data in the case where the College is tracking students by identification number. We also inquired as to the college's interest in and capacity for developing a student tracking system for measuring attrition and graduation rates more accurately and whether the College had been tracking successful versus unsuccessful leavers. We inquired about the extra costs of developing this capacity.

Here is how the graduation rate measures of these five Colleges compare to the total system and to each other.

	1997/98 Grad Rate	*Enrolment FTE Basis*
Boreal	73%	1,234
Canadore	61%	2,658
Fanshawe	57%	8,839
Humber	53%	11,767
Sir Sanford Fleming	62%	5,145
Average: 5 Colleges	61%	
Average: 25 Colleges	55%	168,779
University Aggregate	71%	242,889

Source: Data provided by Colleges Branch, MTCU

We include program graduation rates for the five Colleges in the Appendix 3 section of the report.

When we examine the graduation rate figures at a program level we discover that:

- The Colleges are tremendously diversified in terms of program offerings. Since separate programs have far different graduation rates, the comparisons of aggregate graduation rates between Colleges present some problems.

- While many of the college programs are similar, there are also some distinct differences. For example, Humber lists 73 programs on its web site, Boreal 51 programs and Sir Stanford Fleming lists 60 programs. Clearly, the programs differ markedly, and of course this provides the job oriented college entrants with significant choice.

The following table presents the distribution of full-time students by program at all Colleges in

College	*Preparatory/ upgrading*	*Visual and creative arts*	*Human services*	*Computing -electronics*	*Business*	*Health*	*Tech.*
Algonquin	4%	12%	13%	21%	29%	7%	14%
Cambrian	10	10	25	12	17	9	17
Canadore	12	9	15	8	31	9	17
Centennial	5	3	11	18	38	8	18
Conestoga	4	6	14	12	30	12	21
Confederation	9	5	21	6	27	9	23
Durham	5	11	17	10	33	8	16
Fanshawe	12	13	12	8	28	7	19
George Brown	3	18	14	9	28	16	13
Georgian	3	12	10	8	39	12	16
Humber	5	17	10	14	32	11	12
Lambton	17	4	19	8	24	6	22
Loyalist	6	17	26	10	20	6	16
Mohawk	4	10	13	16	24	15	18
Niagara	8	12	21	13	30	6	10
Northern	8	2	22	11	23	11	23
St. Clair	5	7	11	11	23	15	28
St. Lawrence	12	3	16	16	28	18	7
Sault	9	4	17	14	14	12	30
Seneca	4	10	11	22	38	3	13
Sheridan	7	28	16	11	28	2	7
SSFleming	2	1	25	7	22	8	36
La Cite	5	16	24	20	17	7	10
Boreal	9	0	22	8	20	27	14
Grand Lacs	0	14	17	5	45	18	0

Note: Based on 1997-98 data (full-time students).

Ontario. Both Boreal and Canadore have 12% of their students in Preparatory/upgrading programs. Humber and Fleming, on the other hand, have only 5% and 2% respectively of their students in these programs. Humber, Fleming, Canadore and Fanshawe have between 28% and 32% of their students in Business programs, while Boreal has only 20% in these programs. Boreal however has 27% of their students in Health programs. None of the other four Colleges has more than 11% in these programs. Fleming has 36% of their students in Technology programs while the other Colleges have less than 19% of their students in these programs.

In light of these differences, it is not surprising that graduation rates differ among these Colleges.

5.2 Separate Comments Based On Discussions With College Officials

Boreal

Boreal is a relatively new Francophone College which began its operations in 1995. Boreal has more female than male students, and its administrative system is unable to track the student population based on family incomes. However, the College knows that may of its students are presently receiving social assistance, and that the average age of the students is between 24 and 29 years of age. Boreal's students are heavily dependent on external financial aid.

Since the families of the College's students often have had little formal education, the College has had to introduce mechanisms to support student study skills at the entry level. The College emphasizes that a considerable number of its students are mature and in debt before they arrive at the College.

The College has minimal student tracking in place, though a common student numbering system does exist that could be used to track individual students. The College does track students for graduation purposes. As in the other Colleges, Boreal's students seem to be in motion; i.e. considerable program experimentation and movement.

The College is proud of its common first year program in three areas: business, human services and technology. The College often has students finishing a two-year program with one diploma, then adding an additional year and receiving a second diploma. That is, after three years, they end up with two diplomas in two different programs.

The College acknowledges the improved information flow associated with a student identification and tracking system. The College could not estimate the additional costs of implementing a student tracking system. And as in other Colleges, Boreal would like to see the individual tracking for graduation stretched out beyond six months of the normal program.

A measurement problem might arise with respect to the common one-year program. In the above example, what is the actual point of entry for a student who finishes after three years with two different diplomas? This could be a serious problem in terms of measuring the graduation rate.

Canadore

The officials pointed out that the Colleges are very different from the Universities. They emphasized three important differences: Colleges provide more program offerings than Universities; the student mix is very different in that Colleges have a higher proportion of older students; and finally, Colleges are not identical to each other as each College tends to focus on programs that they excel in.

Canadore has a withdrawal form which it tries to have its "early leavers" complete. According to the information, students seem to withdraw primarily for personal reasons or financial need. The College also employs informal surveys of early leavers. But a large number of students leave without any explanation.

It is interesting to note that Canadore has used a cohort measure of program graduation before it was introduced by the Ministry. Canadore found the measure useful because it assumed that any movement of students was roughly similar from year to year. The College has the potential to create a historical cohort track record based on its own records, but this would be costly and require extra resources.

It was recognized that the student tracking approach was superior to that of the cohort approach. Canadore could introduce a student tracking system based on its student identification number, but it would involve the development of some extra computer software and other costs.

Finally, the College worries about the misuse or damage that could result from the dissemination of program graduation rates. On balance the College sees value to a direct student tracking approach for measuring graduation.

Fanshawe

Fanshawe, and the other Colleges, have a form that students fill out when they withdraw. But they do not have a survey of early student leavers. However, Fanshawe has a system for identifying students at risk based on the incoming grades of the students. This represents the full extent of student tracking.

Fanshawe provided us with written answers to our structured questionnaire. Several excerpts are set out below.

- 41% of Fanshawe student population enter College directly from high school, compared with the system average of 46%;
- Many more students in College are married or sole-support;
- Fanshawe does not use pre-admission testing for entrance to the College;
- Many programs at Fanshawe now have common curricula in at least the first semester;
- The College administered an exit survey in 98/99. In general, the results of the survey were inconclusive, with the majority of students stating personal and financial reasons for leaving;

- The anticipated extra costs (to shift to an individual student tracking system would include approximately one programmer for a year ($50,000) plus $10,000 for equipment. On-going costs would be approximately $10,000.

Humber

One of the College's key officials has been researching the subject of retention and graduation for about 20 years. Consequently, the College has been tracking individual students and student leavers and has developed a software program that has been shared with other institutions. The College has been using a student tracking system for planning and programming. The College has also been measuring student aptitude at entry and at the point of graduation.

On an empirical basis, Humber data suggest that approximately one-third of all first-year entrants leave the system. The one-third ratio fluctuates over time depending upon the strength of the job market. Clearly, in a strong cyclical upturn, the pull out of the Colleges into the job market is higher. Of those who leave programs and/or the College, roughly 40% of the leavers are regarded as successful leavers, with the other 60% as failures.

Successful leavers are likely to be older students, with higher skill levels at entry, who were unclear about the college program delivering a job. .

Sir Sanford Fleming

This College has been involved in some extensive student tracking, and has calculated its own graduation rates by program based on the individual student number. The College is convinced that the individual student tracking method yields far better information. The College started the tracking program for entry classes in 1994-95, 1995-96 and 1996-97. Its tracking method identified conditional graduates and non-graduates, and students who graduate from different programs than they started in.

The College recognized that this kind of information is superior and it was uncomfortable with the assumption that with the present cohort approach every thing evened out. The College also feels that the individual student tracking system to be imposed should be similar to the one used by the Universities. Finally, it is also important to understand and identify student mobility between programs and in and out of the College.

The College does not have any follow up information with respect to the labour market success of its leavers beyond the KPI filed information. The College does, however, interview students with respect to reasons for withdrawal. The primary reasons seem to be personal, financial and/or program related.

Sault College Of Applied Arts And Technology

Since Sault College was unable to provide input though the Roundtable discussion, officials at the College wrote to Arthur Donner with respect to the College's practices and interests. The information is included under this section.

The key issues identified were:

- Students typically do not graduate in the time frame specified for their programs. The majority of three-year program registrants will graduate in a time frame beyond three years.

- The number of programs that have future options available to the student has increased over the last five years. Students can opt for a different program after their first year. This causes difficulty in calculating a graduation rate based on the first year cohort.

- Uncompleted courses at the end of a semester and subsequently finished, may cause the student to graduate after the peer group. Our system does not then include this graduate in the cohort.

- GAS program is designed primarily as a feeder program and therefore should not be included in the Graduate calculation.

- Transfers in and out of a program will change the cohort and therefore affect the graduation rate based on the present definitions.

- If clustering is allowed on a College by College basis, there will be no system data that are comparable.

- Our present client information system does not allow tracking by student. If a recommendation emerges using this type of tracking method, Sault College will not be able to comply.

The College also put forth the following possible recommendations:

- Have MTCU calculate a retention rate across the system by using the enrolment data already submitted for audit purposes and the graduate data also completed by audit.
- Drop the graduation rate as a KPI. Concentrate on the employment rate and student satisfaction.
- If retention is deemed as critical, concentrate on year-to-year retention as a measure of performance, not on the graduation rate. This would allow the system to generate data on why students leave and recommend solutions.
- If the graduation rate is deemed critical, allow the time frame to exceed the program duration.
- If a student tracking system is deemed appropriate, Sault College will require Ministry support to change its Information Systems to comply.

6.0 CONCLUSIONS

6.1 Measuring Student Success

Most Colleges reject the status quo measure of graduation and attrition and accept that a new methodology is needed.

There are three important issues regarding graduation rates – how should graduation rates be measured; what do comparisons of graduation rates across post-secondary institutions tell us about the labour market success of students who attend these institutions; and should graduation rates be used for funding allocation decisions by the provincial government?

It is clear that using graduation rates as a measure of student success in comparisons across institutions may yield misleading conclusions unless one normalizes these rates for differences in the socio-economic demographic composition of the student bodies, mix and number of program offerings, labour market conditions and admissions standards. However, this normalization process would be difficult, if not impossible. In other words, one needs a multi-variate measure for student success.

Furthermore, even if one could construct such a measure, what would be the appropriate comparator group of post-secondary institutions – only Colleges in Ontario, all Colleges across Canada, all Colleges in North America, or all post-secondary institutions in Ontario, Canada or North America?

Cohort tracking systems may produce reliable measures for the graduation rates at the aggregate level if appropriate starting and end points are selected and a forward moving cohort measurement system is used. The current cohort systems used by Colleges in Ontario are inappropriate and produce graduation rates that are too low because they use too early a starting point for most programs, but more critically, too early an end point.

If graduation rates, however they are measured, are used without normalizing for institutional differences, including their mandates and roles within the province, as a KPI for provincial allocation of funds to post-secondary institutions, they may distort planning at Colleges. In addition, this could also inhibit the ability of Colleges to adapt to changing economic and social conditions.

Graduation rates, properly measured, can be useful for the Colleges for internal planning purposes. But without normalization and qualification, graduation rates that become public information may lead to incorrect decisions by students considering their post-secondary education and training options, in addition to inappropriate allocations, from an economic efficiency perspective, of government funding of post-secondary education and training institutions in the province. Colleges do not really know what appropriate graduation rates should be, so how can the public be expected to interpret these rates and make the right decisions.

Nevertheless, graduation rates may be turned to as a measure of success. So it is imperative that the measurements be improved. It is also important that they not be used without any qualifications or adjustments.

One could attempt to normalize graduation rates through the use of econometric techniques. That is, one could use a cross-section and time series data set consisting of graduation rates (measured in the same way for all post-secondary institutions in the province); demographic, education and employment characteristics of the student bodies; local economic conditions; and one or more sets of dummy variables for each post-secondary institution in the province. The dummy variables would reflect differences in the roles of these institutions. Regressing the graduation rates against these other variables would provide a means for normalizing graduation rates for each institution.

While the resulting normalized graduation rates would be useful as a KPI for budget allocation decisions by the province, they still may be weakly correlated with student or institutional success. Hence, some other measures should be developed that together with normalized graduation rates provide more comprehensive indicators of student and institutional success.

6.2 Graduation Rates as an Indicator of Success for Colleges

Colleges are more unique than Universities. Students entering the Colleges from high schools are more immediately required to make career choices than their counterparts entering Universities. That is, to a greater degree than is possible at the college level, students entering University can select a number of courses in their first year before they decide to specialize.

Moreover, the graduation rate is only one output measure, and downplays the measures of inputs. Open and easy access to Colleges compared with Universities makes a big difference on the input side. Open and easy access is regarded as a societal goal. Colleges do not require high school OACs. As well, the graduation rates of Colleges may be biased downwards because they accept a relatively high proportion of special needs students who are less likely to graduate.

Success at the college level involves more than graduating students. In some programs, graduation and a certificate are necessary to qualify for a job. For other jobs, formal credentials are not required. Only some degree of training and work experience are necessary.

The graduation rates as currently measured by the Colleges are most likely underestimated in comparison to the graduation rates produced by the methodology used by the Universities in Ontario.

Comparisons of the aggregate graduation rates between Universities and Colleges at present would be misleading for a number reasons. Comparisons of program graduation rates at Colleges to graduation rates at program levels in Universities would be completely misleading. The introduction of a student tracking system at the college level would help provide for more meaningful comparisons.

Indeed, mounting a pilot program involving a small number of Colleges would provide useful information to determine whether the introduction of a student tracking system similar to the Universities would be useful and cost effective.

However, whatever system is used to measure graduation rates for the Colleges, it is important to use appropriate entry points (the time when a student actually begins a program) and end-points (the elapsed time for a student to have completed a program). This also suggests that there would be value in a pilot program where each College experimented with different entry and graduation time frames.

It is important to keep in mind that success is multi-faceted, so there is a need for other measures besides successful graduation. Some of these measures may have to be institution-specific since Colleges differ in many ways. In developing other indicators and a better measure of graduation rates, historical context will be very important. A one-size fits all approach may not be appropriate.

Graduation rates should be expected to differ across Colleges and programs and between Colleges and Universities. However, there probably is some kind of steady state or base case level of measured differences. If one could normalise for these differences, then one could start to determine how to improve upon the differences.

Current aggregate college graduation rate measures can mislead because of differences in demographics, different admission standards, different mix of programs and courses, and different labour and economic market conditions. The public rarely considers all of these variables in terms of reflecting upon the meaning of an aggregate college graduation rate figure.

What all of this suggests is that even comparisons of aggregate graduation rates across different Colleges is somewhat misleading without a long track record of graduation rates to compare. Moreover, the same case can be made for University comparisons within their system. Comparisons across Colleges and Universities, while perhaps interesting, provide very little useful public policy insight.

6.3 KPIs

The numeric approach associated with KPIs is intended to provide a useful tool for students selecting between different Colleges and between Colleges and Universities. At the same time, the numerical approach allows the MTCU to evaluate whether each College is achieving its objectives as reflected in large part in graduate employment, graduate satisfaction, student satisfaction and employer satisfaction.

Implicit is the thinking that somehow the KPIs can capture best practice delivery of programs, training, and ultimately jobs. But in broad brush terms, the numerical approach associated with KPIs suggests a level of precision that may not really be appropriate.

For example, when linking KPIs to the labour market opportunities of graduates (the most important final outcome), it is clear that there is a significant time frame problem. That is, the effects on labour market outcomes have to be measured at an individual level and over time. But there are many "non-controllable variables" which are also determinants of labour market success – ethnicity, socio-economic background, region, pre-school family incomes, education levels of parents, literacy, etc.

As well, there is the issue of the quality of the working career post graduation from College; for example, income levels over time, the stability of the job, the nature and flexibility of the job (part-time, full time, self employment, etc.).

But there is a strong case to be made that the college graduation rate may not truly reflect labour market success. On the positive side, it might well be that well structured KPIs are a useful catalyst for change with respect to all of the stakeholders and could lead to more focused action with programs moving in the right direction.

Each college recognizes its obligation to its many stakeholders to provide assurance that its activities are inclusive of and consistent with its specific values, goals and strategic direction. External accountability processes could provide objective means by which those who use, support and fund the Colleges can be assured that their confidence is well placed.

6.4 Recommendations

Measurement Of Graduation Rates

Graduation rates can be estimated for individual programs, for clusters of programs and/or at the aggregate institution level. Graduation rates for individual programs or clusters of programs will be useful for internal planning by each College. Institutions need to monitor what happens internally from semester-to-semester and among programs.

But graduation rates for individual programs can be misleading for students making decisions regarding institutions and programs and may be inappropriate for making funding allocation decisions across post-secondary institutions. The links between student/institution success and graduation rates are even more tenuous at the program level than at the level of the institution. Consequently, if graduation rates are to be used as one of the KPIs for funding allocation decisions by the province, college-wide graduation rates are preferred relative to the program graduation rates.

In addition, these rates should be normalized using the econometric methodology we outlined above.

The graduation rates can be calculated using any one of the following three models:

- cohort tracking: group A at time X and compare to group B at time X+Y;
- cohort tracking: group A at time X and compare to group A at time X+Y;

- individual student tracking: each individual starting at time X and compare to same set of individuals at time X+Y.

In the absence of a pilot program comparing cohort model 2 with individual tracking (model 3), we cannot choose between these two models. But either one is preferable to the current approach – cohort model 1.

Over time, we would suggest moving to a system where students are given a provincial student number so that they can be tracked if they move from one institution to another. In other words, individual student tracking across the entire post-secondary education/training system in the province is the preferred model in the long run.

If graduation rates are to be estimated using individual student tracking, the province should subsidize, through a one-time cash payment, the costs for each College to acquire and develop the needed computer hardware and software. Only the province, using its financial levers, can ensure that a uniform system – computer software, similar length student identifiers – will be developed by all the Colleges.

A pilot study involving a small number of Colleges should provide a reasonable estimate of the upgrade costs for all Colleges. Of course, the financial assistance by the province should involve new money and not arise from a reallocation of existing operating and capital grants.

At this time, it appears that the following Colleges would have some difficulty in moving quickly and at minimum cost to student tracking system based on institutional individual student numbers for calculating graduation rates – Boreal, Confederation, Durham, Fanshawe, Lambton, Northern, St. Clair and Sault.

As for the time periods – X and Y – we recommend that X begins after the first semester following the entry of a student into a program. This will exclude those students who are uncertain about whether or not they made the right decision to go to College and about whether they selected the right program. Further, we recommend that Y be at least 150 percent of the time period for completing a program (this happens to be the official US NCES norm) – 4.5 years for a three-year program; three years for a two-year program and 1.5 years for a one-year program. Furthermore, feeder programs and remedial programs should be excluded from the graduation rate calculations.

The combination of a pilot program and Y years of tracking the first group of students means that it will take at least five years before any meaningful information will flow from the new measurement system. The pilot project however, will provide in a much shorter time frame an indication of how reliable the existing cohort tracking method is in generating estimates of aggregate, institution level graduation rates. Assuming a forward moving cohort system produces reasonable estimates, then it may be appropriate for the government to have greater confidence in the normalised graduation rate figures for planning purposes.

Nonetheless, it is crucial to remember that even the current five KPIs together may not provide an accurate measure of the success of each College in achieving its goals. Other KPIs, some of them along the lines of those used in BC, may be needed in order for funding allocations to create the right incentives for Colleges.

Pilot Projects

The provincial government should sponsor and underwrite the costs of several pilot studies. A small number of Colleges (3-4) should be selected to develop individual student tracking systems. The Colleges should experiment with different entry points and time frames for measuring graduation rates. In order to provide information more quickly, the Colleges should apply the system to historical data; that is, they should go back four or five years if possible.

The Colleges should differ in terms of size (student body, number of programs), current level of sophistication in tracking students and geographic location. The roles of the pilot projects should be as follows:

- to see if the additional costs of a more complex tracking system are warranted by the production of more reliable estimates of graduation rates;
- to estimate the system-wide costs of moving to a more complex individual student tracking system;
- to examine the impacts on measured graduation rates of different assumptions for starting and end points; and
- to see whether there is a high correlation between graduation and labour market success.

The MTCU should not rush out to create a new system that might be too costly and/or produce marginally better estimates of graduation rates and other measures of student success. There is a need to experiment to find the most appropriate measurement methodology. The MTCU should also examine the feasibility and costs of moving towards provincial student numbers and province-wide tracking of students.

6.5 SUMMING UP

The graduation rates and the attrition rates are important public policy educational indictors. But at best they represent only rough proxies for student success in the labour market.

Attrition rates are important financial indicators for the Colleges. To some, attrition symbolises the wastage of educational investment funds; whereas in fact, some attrition may be a healthy sign of a strong job market.

Consequently, there is a need to improve the data on graduation/attrition rate measures at the college level. Experience suggests that the optimal system would track students directly.

The Ontario government allocates about $700 million annually to the Colleges, and thus the attrition information is useful, and relative to the total budget, the extra funds for improving the

measuring of graduation rates and for developing other measures of success should be found. There is a strong case for investing more money in the measurement of graduation rates so as to improve on the quality of the data on a program basis.

Note that the government surveys college graduates for their employment records. There is no comparable survey of attrition (successful or unsuccessful in job market terms) from the system. There is a need for good data relating to why students leave and their subsequent employment records.

In closing,

- While the four KPI measures that are tied to funding at the college level are useful to all of the stakeholders, the current measure of graduation at the college program level is flawed and misleading.

- The aggregate measure of graduation at the college level is probably reasonably representative of the total picture. However, comparisons across Colleges can be misleading, particularly since there is no attempt to normalize the data for differences in programs, location, and/or the demographics of the student population. .

- The introduction of a university style measure of graduation at the program level (i.e. following individual students rather than cohorts of students) would be an improvement over the current system. But recognize that using a college institution identifier will still have the problem of capturing and measuring students moving between different Colleges and in and out of the college system programs (either to the job market or to other post-secondary educational opportunities).

- ACAATO should propose that MTCU move towards introducing a student tracking measurement system for graduation based on the Colleges' student identification numbers.

- To ensure that the graduation rate data at the program level are reliable and not misleading, ACAATO should suggest that MTCU sponsor several pilot studies, experimenting both with measurement and interpretation of the data. While the university measurement system based on student tracking is superior to the current college cohort basis measure, it is also clear that even the university style system has some problems. Consequently, The Ministry is advised not to rush out to create a new system that could also mislead. There is a need to experiment to find the most appropriate measurement approach.

- ACAATO should also petition MTCU to undertake a survey of early leavers from college programs, attempting to identify successful from unsuccessful college leavers in terms of the job market.

- How long will it be before meaningful graduation information flows from a new system – at least five years after the new system is introduced.

- Finally, the best system would be based on provincial student identification numbers, since this would allow the Ministry to track students in and out of of post secondary institutions and in and out of the labour market.